

**CLAIMS**

What is claimed is:

1. An adaptive analog equalizer that operates on a signal, comprising:
  - a high pass network and a multiplier, the multiplier has an adjustable gain that
  - 5 is adjusted using gain control;
  - the high pass network and the multiplier have a frequency response that, when adaptively applied to an input signal, are operable to compensate for corruption in the input signal;
  - the gain control uses an output of the adaptive analog equalizer to adjust the
  - 10 adjustable gain of the multiplier; and
  - the high pass network and the multiplier modify the input signal, the modified input signal is summed with the input signal.
2. The adaptive analog equalizer of claim 1, wherein the input signal
- 15 comprises a channel corrupted input signal.
3. The adaptive analog equalizer of claim 1, wherein the input signal is provided from a communication channel, the communication channel having a channel frequency response; and
- 20 the frequency response of the high pass network and the multiplier is substantially an inverse of the channel frequency response.

4. The adaptive analog equalizer of claim 1, wherein the gain control performs decision and sampling control of the output signal; and  
the gain control integrates an output signal from the decision and sampling control using an integrator.

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5. The adaptive analog equalizer of claim 1, further comprising a variable gain amplifier, an integrator, and a peak detector; and  
wherein the output signal is passed through the peak detector and the integrator to provide a control signal for the variable gain amplifier.

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6. The adaptive analog equalizer of claim 1, wherein the adaptive analog equalizer performs double sampling of the input signal.

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7. The adaptive analog equalizer of claim 1, wherein the adaptive analog equalizer waits a first predetermined period of time after detecting a pulse rising edge before sampling a first sample of the input signal; and  
the adaptive analog equalizer waits a second predetermined period of time after detecting the pulse rising edge before sampling a second sample of the input signal.

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8. A double sampling adaptive analog equalizer, comprising:  
a gain control unit comprising a decision and sampling control circuit, the  
decision and sampling control circuit is operable to perform double sampling of an  
input signal; and  
5 the gain control unit comprises a gain control processed feedback loop that  
forces the input signal to a predetermined value within a bit period after detecting a  
pulse rising edge.

9. The double sampling adaptive analog equalizer of claim 8, wherein the  
10 decision and sampling circuit waits a first predetermined period of time after detecting  
the pulse rising edge before sampling a first sample of the input signal.

10. The double sampling adaptive analog equalizer of claim 9, wherein the  
first predetermined period of time is less than a pulse period.  
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11. The double sampling adaptive analog equalizer of claim 8, wherein the  
decision and sampling circuit waits a second predetermined period of time after  
detecting the pulse rising edge before sampling a second sample of the input signal.

20 12. The double sampling adaptive analog equalizer of claim 11, wherein  
the second predetermined period of time is greater than a pulse period.

13. The double sampling adaptive analog equalizer of claim 8, wherein the predetermined value is zero.

14. The double sampling adaptive analog equalizer of claim 8, wherein the  
5 adaptive analog equalizer structure comprises a high pass network and a multiplier  
having an adjustable gain.

15. The double sampling adaptive analog equalizer of claim 14, wherein  
the input signal is provided from a communication channel, the communication  
10 channel having a channel frequency response; and

a frequency response of the high pass network and the multiplier is  
substantially an inverse of the channel frequency response.

16. A method to perform analog adaptive equalization, the method  
15 comprising:

detecting a pulse rising edge of an input signal;  
waiting a first predetermined period of time after detecting the pulse rising  
edge before sampling a first sample of the input signal;  
waiting a second predetermined period of time after detecting the pulse rising  
20 edge before sampling a second sample of the input signal; and  
adjusting a gain of a multiplier when the second sample does not exceed a  
predetermined threshold.

100-200-200-100-100-100

17. The method of claim 16, wherein the first predetermined period of time is less than a pulse period.

18. The method of claim 16, wherein the second predetermined period of time is greater than a pulse period.

19. The method of claim 16, wherein the input signal comprises a channel corrupted input signal.

10 20. The method of claim 16, further comprising forcing the input signal to zero within a bit period after detecting the pulse rising edge in response to a one to zero transition.

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